UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

SUBJECT: Greenwood Chemical OU4 7-03-00

FROM: Nancy Rios Jafolla, Toxicologist
Technical Support Section (3HS41)

TO: Phil Rotstein, RPM
Federal Facilities Branch (3HS50)

As requested, I have calculated a recreational cleanup level for free cyanide in soil. The cleanup level that is protective for non-cancer risks (cyanide is not a carcinogen) for all possible recreational receptors (child, adolescent and adult) for the ingestion exposure pathway at the site is 136875 ppm. Note that the dermal exposure route was not assessed due to insufficient toxicity information at this time.

The assumptions and parameters used to back-calculate to the protective concentration (i.e., a Hazard Index of 1) in soil for the child recreational receptor are on the attached spreadsheets. Note that the cleanup level for non-carcinogens is driven by the risk to the child recreational receptor. Therefore, the attached spreadsheet is set-up to calculate non-cancer risk only for the child receptor, not for the adult and adolescent as was done for arsenic. Briefly, the child was assumed to be exposed for 48 days/year (3x a week for the warmer months-typically June-September) for 4 hours/day (i.e., approximately 50% of the time assumed to be spent outdoors based on the Exposure Factor Handbook, 1997). The ingestion rate was assumed to be 50% of that assumed to be ingested by a resident (i.e., 100 mg/day for the child) based on professional judgement.

Since it is expected that recreational activities will occur at this site, the soil cleanup levels developed for arsenic and free cyanide should be achieved down to 1-2 feet below ground surface depending on the type of recreational activities expected to occur at the site.

Please let me know if you need further explanation regarding how the recreational cleanup levels were calculated for this site.

cc: EJohnson (3HS41) w/attachments
DKargbo (3HS41) w/o attachments

SSLs-Greenwood Chemical-OU4
Soil Ingestion

THQ	1.00E+000			
TR	na			
EFr	8	d/y--->	48d/y *4h/d *1d/24h	
IFSadj	na	mg-yr/kg-d		
BWc	15	kg		
EDc	6	y	Screening Level (mg/kg) - cancer =	TR * ATc
IRSc	100	mg/d		SFo * 1E-06 * EF * IFsoil/adj
ATc	25550	d		
ATnc	2190	d	Screening Level (mg/kg) - non-cancer=	THQ * BW * ATnc
SFo	chemical specific	mg-kg/d		(1/RfDo) * 1E-06 * EF * ED * IR
RfDo	chemical specific	mg/kg/d		

Surface and Subsurface Soil--Recreational

Contaminant	RfDo	SFo	Cleanup Level (non-cancer)	Cleanup Level (cancer)
Ingestion only				
Free Cyanide	2.00E-002		136875.00	na

*Note the algorithms are the same as those presented in the SSL Guidance, 1996
Non-cancer risks are based on the more conservative child receptor
na-not applicable

Greenwood Chemical-Recreational Soil Cleanup Levels for Free Cyanide
Summary Table

	Child*	**Child/Adolescent**	**Child/Adult**
Exposure Scenario	Non-cancer	Cancer	Cancer
Ingestion-Child/Adult	136875	n/a	n/a
Ingestion-Child/Adolescent	136875		
Dermal-Soccer No. 1-50th	n/a		
Dermal-Soccer No. 1-95th			
Dermal-Soccer No. 2 and 3-50th			
Dermal-Soccer No. 2 and 3-95th			
Dermal-Gardener-50th			
Dermal-Gardener-95th			

all cleanup levels are in ppm
*Daycare Kids No. 1 was assumed for all exposure scenarios.
All noncancer risks were based on the more conservative child receptor.
n/a-not applicable for this chemical due to uncertainty in extrapolating between the oral-to-dermal route; Also, cyanide is not a carcinogen